LESSON 5: WHY AND HOW DO I CONDUCT A STUDY SITE EVALUATION?

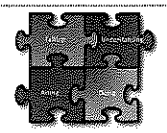
OVERVIEW

In the first activity, students will talk about the different approaches that can be taken to researching in science, with a specific focus on those approaches that are most useful for urban ecology. They will then complete an initial physical and biological assessment of their field site using a data collection form. Students will use the field study site in this and other modules so they need to understand why it is important to conduct an initial survey of their site. Students will also generate some initial questions that they have about their study site.

SUB-QUESTION:

What does my study site look like at the start of the year?

Ways of Knowing Urban Ecology:



	Students will...
Understand	• Understand the attributes of urban ecology as a science.
Talk	*No specific goals connected with talking about urban ecology in this lesson.*
Do	• Gather ecological data in the field. • Describe several ecological characteristics of their field site. • Describe their field site qualitatively and quantitatively.
Act	*No specific goals connected with acting on urban ecology in this lesson.*

SAFETY GUIDELINES:

Refer to the Safety Protocols used in **Lesson 2** for working safely outdoors.

PREPARATION:

Time:

1-2 class period

Materials:

Activity 5.1

Copies of Representation of Inquiry Worksheet

Activity 5.2

Student notebooks or clipboards with blank paper and pencils
Survey data worksheets
Maps that include the study site – if available
Thermometers for air, water and soil temperatures
My Questions Worksheet

INSTRUCTIONAL SEQUENCE:

Activity 5.1: Understanding Scientific Inquiry

1. Distribute the representation of inquiry worksheet and discuss how the study of urban ecology might play out in this representation. Possible discussion questions
   - What kind of questions would researchers be interested in studying?
   - How would they collect their data? What type of data would be collected?
   - How is this type of research different than experiments? How do the concepts of controls and variables apply or not to this type of research?
2. Key ideas to consider about urban ecology research
   - Studying a dynamic system – constantly changing, therefore more interested in resilience than expecting a constant state of being.
   - Takes into consideration the social aspects interacting with the ecosystems, therefore history and legacies are important.
   - Humans are an integral part of the system.
   - In studying systems, many variables may be at play simultaneously and they are not necessarily controllable.

Activity 5.2: Site Survey

In this activity students will become familiar with the ecosystems of their field site.

Site Survey Background for Teachers

Defining a field site is the first step before beginning a site survey. The most important thing is to set the boundaries for your site. A site survey is a careful description of the biotic, abiotic and man-made aspects of a particular area.

Teaching Strategy

At this point you can ask the students what they think the purpose of a site survey is, what are some of the things they would look for if they wanted to conduct a survey of the area around their school and why it is important to conduct an initial site survey.

Depending on the student responses you should discuss the nature of a site survey; it will be important to help the students understand why it is important to conduct an initial site survey and that this data provides a baseline against which they can compare their additional work in the future.

It is also important to let the students know that they will be studying the changes to the

site over the course of the year and that it is important to get familiar with their site so they can document any changes that they see over time.

Teacher Background Knowledge

Site surveys are important because:

1. Surveys are the first step in projects ranging from habitat restoration/preservation actions, to new home or shopping area construction, to scientific studies. Without a clear understanding of a site, decisions can not be made about how to use or study it appropriately.
2. Surveys provide an ecological snapshot of a field site at one point in time.
3. Performing a site survey is useful for conducting long-term and short-term studies. For example, with short-term studies students can form hypotheses about their site based on their field experience mapping and surveying the site. These can include hypotheses about percent cover of certain habitats or expected plant and animal species.
4. Repeating surveys allow long-term data to be collected. This is particularly important as the students study their site over time.

Below are brief statements describing each of the categories or questions present on the survey data form. The information explains why the data collected during the survey is important for understanding the ecology and environmental health of the field site.

PHYSICAL OBSERVATIONS OF A SITE

- The bulk of the data that students will gather during the site survey will be on the physical aspects of the site. This includes what it looks like, what it sounds like, and any other unusual characteristics around the site.

WEATHER

- Current weather conditions are important in determining if events occurring at your site are typical or circumstantial. A recent storm event or even just a moderate amount of rain can affect the plants and animals along with river depth, width, and flow. Cold and/or cloudy conditions can influence the presence and activity of plants and animals.

PLANTS AND ANIMALS

- Humans also have an effect on the presence of specific plants and animals found in open areas. Field study sites will vary depending upon how much landscaping has been done in the area. Sites may vary from being wild and overgrown to being garden-like.

TERRESTRIAL HABITATS

- There are many different habitats that make up terrestrial environments. Habitat is the place or type of environment where an organism typically lives. These are defined by the predominate features of the area. For example, forest habitats are dominated by tree species while grasses dominate in field habitats.

TRASH

- Trash is present at many sites and should not be seen as a deterrent to conducting ecological studies. Even pristine sites have trash in the form of soda bottles that float downstream or a plastic bag that has been snagged in a tree. Have students think about their own habits regarding trash and how trash can affect an area, both visually and ecologically.

POLLUTION

- No sites remain untouched by humans. Even those sites termed ecologically pristine are not free from human impact. Identifying sources of pollution at a field site will help answer questions about behavior and distribution of the organisms found there. Some sources of pollution found outside of the bounds of the site may still have an impact on things within the site. For example, an industrial pipe upstream may have a large impact on the stream's health. Best guess estimates should be used to complete this section.

How to Do the Site Survey

1. If you haven't already done so, introduce the concept of site evaluation and explain the importance of this information. Discuss the background information for the various survey categories.
    - The students should work in pairs or trios for this site survey. They should follow the protocol on the Site Survey Worksheet, but students should get into the habit of using their field notebooks as well. Observations will be made and data will be collected that will be of use on future visits to the study site.
    - They should look for and document "unusual observations" as well as predictable patterns in the field.
    - They should also start to write questions that might arise while at the field site.
    - Students should also get into the practice of being diligent in completing their work in the field so that they can finish their tasks and not be late to their next class.

2. In the field, give students the site survey forms, clipboards and field notebooks. Students should work in teams of 3-4 people if possible.

3. After students have completed the site survey, gather together to discuss their observations. This is best done in the field, but it can be done in the classroom. In a circle, have students or groups each describe their most significant or an unusual observation made during the site visit, or they can ask the group a question that they thought of while at the site.

Common Student Misconception
A common misconception that students may have is that urban areas will have little to no open space. In general, urban areas do have less open space than non-urban areas. However it is important that students begin to recognize that urban areas do have open spaces.
In fact, there are significant benefits of open space. These benefits include increased investment by business, increased economic activity, attraction and retention of residents and more tourism.

Closure and Developing some initial questions

It is important that students start to develop some questions that they may want to investigate and begin to get in the habit of developing some research questions. This will lead into the next lesson, which focuses specifically on developing researchable questions.

1. At the end of this activity or as a homework assignment, you should have the students jot down some questions that they would find interesting to investigate to better understand their study site (as suggested in the last step of the previous activity).

2. Have the students write their questions in their science notebook so they can have a record of their questions. It is also important over time to revisit the initial questions because they will change over time and that is an important part of science because as one learns more, the questions become more complex and often times more focused.

    - The reason why this step is important is that in the next and future modules students are going to need to develop research questions that they will then investigate and present their findings.